

Ohio, snow began at 7.05 a. m., with a gale reaching a maximum velocity of 60 miles per hour from the northeast, and an extreme of 88 miles; the storm was the heaviest ever experienced; the Weather Bureau observer at that place reports that snowdrifts in some places reached 8 feet high; considerable damage was done by high wind, and traffic was suspended; the gale caused the water in the river to rise rapidly, flooding docks and cellars. The heaviest storm in the history of Chicago began in the early morning; snow began at 5.30 a. m., and continued during the day; the wind averaged nearly 70 miles an hour from the northeast for more than ten hours and reached a maximum velocity of 84 miles at 11 a. m.; damage was done to the amount of \$250,000. At Detroit, Mich., snow began at 9.20 a. m., and continued during the day, accompanied by high wind; trains were delayed throughout the State, and business in general suffered. At Port Huron, Mich., snow began at 9.51 a. m., with high winds, reaching a maximum velocity of 48 miles per hour; the wind did not go below 40 miles an hour during the afternoon, drifting the snow in some places to a depth of 6 feet. At Milwaukee, Wis., snow began during the early morning, accompanied by a gale of 42 miles per hour, drifting the snow badly. The storm was general throughout Iowa, Kansas, and Missouri, and traffic was greatly delayed.

**15th.**—At Key West, Fla., high winds attained a maximum velocity of 42 miles per hour; 23 miles west of Key West a bark went ashore. A thunderstorm, with high wind

and heavy rain, moved northeast over Alexandria, La., about 1 a. m., damaging property to the extent of \$10,000.

**17th.**—During a thunderstorm on the Arkansas River, near Little Rock, Ark., a man was killed by lightning.

**19th.**—A thunderstorm at Hightstown, N. J., caused minor damage. Damage was caused by heavy rain and high wind in California, north of San Francisco. Damage was done by a windstorm which began in Nevada on the 17th and continued during the 19th.

**22d.**—A report from Los Angeles, Cal., states that a severe norther prevailed in that section. Great damage was done to oranges and other fruits.

**24-26th.**—Unusually severe snow and sleet storms prevailed from Massachusetts over the south Atlantic States, and extended over the Ohio Valley and Tennessee to Texas, attended by heavy gales from the New England to the North Carolina coasts.

Special warnings of heavy snow were sent out to the observers of the Weather Bureau at Washington, Baltimore, Philadelphia, New York, Pittsburg, and Buffalo, and to railroads in Maryland, District of Columbia, and Pennsylvania. A tabulated statement giving the beginning and ending and the total depth of snow in the Southern States during this storm is given on pp. 61-62. At Charleston, S. C., and other points in the South early vegetables were considerably injured.

**28th.**—During a thunderstorm at Rush Point, La., a man was killed by lightning.

## ATMOSPHERIC ELECTRICITY.

### THUNDERSTORMS AND AURORAS.

The table on page 69 shows in detail for February, 1894, the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

#### THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is given under "Local storms." The dates on which reports of thunderstorms were most numerous are the 9th, 11th, and 19th. The dates on which reports were least numerous are the 4th, 5th, 6th, 13th, 14th, 15th, 16th, 22d, 23d, 24th. The States from which the most numerous reports were received were: Arkansas, 46; Florida, 40; Louisiana, 73; New Jersey, 28; Texas, 32.

#### AURORAS.

The evenings on which bright moonlight must have interfered with observations of faint auroras were the 15th to 23d, inclusive. On the remaining twenty days of the month 232 reports were received, or an average of 11 per day. The dates on which the reported number especially exceeded this average were the 21st, 22d, 23d, 24th, 25th, and 28th. The period of maximum thunderstorm frequency, viz, the 17th to 21st preceded the great auroral display by several days, but there may have been no very close connection.

The aurora of the 22d and 23d was one of the most remarkable of recent years; reports of its visibility have been received from over 600 stations representing every State, except Indian Territory, Texas, Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, and South Carolina, and this mass of data is worthy of a more thorough analysis than can be given to it in the present REVIEW. The 19th, 20th, and 21st had been marked by an unusual number of thunderstorms in Louisiana and New Jersey and the weather maps of those days show that the low pressures and rain or snow areas in the

Southwest, Gulf, and Atlantic States were finally pushed south and east by the great high area, No. VII, which apparently moved from Siberia into Alaska and southeastward until, on the 22d, 8 p. m., it was central in Wyoming, but on the 23d, 8 p. m., extended as a ridge over Idaho, Wyoming, Minnesota, and Ontario. There was a similar area of high pressure January 12-14, 1893, in Siberia and North America, but I do not know that a special auroral display attended it.

The reports of the aurora of February 22 and 23 show many interesting chronological and geographical correlations, among which I note the following:

1. The reported time of beginning of visibility of the aurora, as expressed in uniform seventy-fifth meridian time, or, if it is preferred, uniform Greenwich time, or any other preferred uniform system, seems to have been earlier on the 23d than on the 22d (16 regular Weather Bureau stations report earlier, 5 later, and 4 the same time). This would be an important point were it not that one must naturally fear lest the occurrence of the aurora on the 22d had made the observers more alert on the 23d.

2. As expressed in seventy-fifth meridian time the aurora began on the 22d between 8 and 9 p. m. in New England, Lake Superior, Minnesota, and North Dakota; between 9 and 10 p. m. in the States south and west of this region, and between 10 and 10.30 p. m. in the extreme southern border and in California, Washington, and Oregon. This correlation with absolute time might be supposed to furnish some suggestions as to the position of the earth in its orbit and of the relation of the aurora to the sun, but the records show that, expressed in the same absolute time, the visibility on the 23d began between 6 and 8 p. m. in New England and New Jersey; between 8 and 9 p. m. in the upper Lake region and Minnesota; between 9 and 10 p. m. at stations south and west of these. The records of the two nights do not seem to show any uniform relation, indicating that the aurora depended upon emanations from the sun; it would certainly be incredible that these, if they occurred, should have hap-

*Thunderstorms and auroras, February, 1894.*

States.	No. of stations.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total.					
Alabama.....	50	T. A.	2	3	2				3			5	4	1	1					3	1								1				26	T. A.				
Arizona.....	56	T. A.													1									2										0	T. A.			
Arkansas.....	44	T. A.		3	4			8	4			9	2				1	10		1									4				46	T. A.				
Colorado.....	81	T. A.			1	2	2						1							1		1	2	9	15	2								0	T. A.			
California.....	324	T. A.			1							1			1							2		9	15	2								34	T. A.			
Connecticut.....	24	T. A.													1					1	1													1	T. A.			
Delaware.....	5	T. A.											2										1	11			1	1		3				15	T. A.			
District of Columbia.....	4	T. A.																					1	2										3	T. A.			
Florida.....	37	T. A.								3	2	2	11	1	2				1	5		2		1			5			5				40	T. A.			
Georgia.....	37	T. A.			1				3			1	4		1				2	2		1					2							17	T. A.			
Idaho.....	24	T. A.																																	0	T. A.		
Illinois.....	57	T. A.							1										1					6	1										0	T. A.		
Indiana.....	45	T. A.						1		1													1	18	19	2	1								41	T. A.		
Indian Territory.....	8	T. A.						1		2		1												13	13	1									29	T. A.		
Iowa.....	77	T. A.																																	0	T. A.		
Kansas.....	68	T. A.			1			1		1									2			1	40	42	3	1									90	T. A.		
Kentucky.....	38	T. A.																						16	7										3	T. A.		
Louisiana.....	52	T. A.	6	1	1		1		8		2	10	3			2		2		7	8	10	5	1	2				4					12	T. A.			
Maine.....	22	T. A.																																	0	T. A.		
Maryland.....	26	T. A.		3	1			1					2							2			7	11		1			2					27	T. A.			
Massachusetts.....	85	T. A.									3																								4	T. A.		
Michigan.....	73	T. A.		2																															67	T. A.		
Minnesota.....	72	T. A.					1				25																								25	T. A.		
Mississippi.....	41	T. A.	3	3	1	1		8		1			8	4	1				2		1	2	50	49	10	3		3	9						147	T. A.		
Missouri.....	89	T. A.	7	1				1	1	6		3							3	4															29	T. A.		
Montana.....	20	T. A.			1	1	1			1																									0	T. A.		
Nebraska.....	70	T. A.																																		0	T. A.	
Nevada.....	35	T. A.													1																					0	T. A.	
New Hampshire.....	29	T. A.										5																								0	T. A.	
New Jersey.....	58	T. A.		3			1	1	1																										5	T. A.		
New Mexico.....	26	T. A.																																		0	T. A.	
New York.....	81	T. A.									2	4																								1	T. A.	
North Carolina.....	56	T. A.									1			5		1																				0	T. A.	
North Dakota.....	35	T. A.																																		0	T. A.	
Ohio.....	134	T. A.		1			1	1		1	2	9		1																						12	T. A.	
Oklahoma.....	16	T. A.											4																							4	T. A.	
Oregon.....	69	T. A.								1																											1	T. A.
Pennsylvania.....	86	T. A.										2																									13	T. A.
Rhode Island.....	9	T. A.																																			0	T. A.
South Carolina.....	42	T. A.																																			0	T. A.
South Dakota.....	43	T. A.																																			0	T. A.
Tennessee.....	41	T. A.		1									1	1																							19	T. A.
Texas.....	66	T. A.			3				6	1		2	10																								32	T. A.
Utah.....	35	T. A.																																			0	T. A.
Vermont.....	14	T. A.																																			0	T. A.
Virginia.....	39	T. A.		2										2																							18	T. A.
Washington.....	49	T. A.																																			5	T. A.
West Virginia.....	35	T. A.																																			0	T. A.
Wisconsin.....	65	T. A.																																			7	T. A.
Wyoming.....	14	T. A.		1	2	2	3		4	1	1			1																							0	T. A.
Sums.....	2,606	T. A.	15	9	13	1	1	1	18	30	49	23	55	41	3	6	3	2	18	11	73	19	23	6	3	4	12	8	2	17					466	T. A.		
			4	17	7	9	9	18	4	3	4	0	3	2	0	0	2	4	3	3	7	38	499	548	63	22	3	56							1338	A.		

pened day after day at intervals so nearly equal to twenty-four hours in this as in many other auroras.

3. On the other hand it is remarkable that the whole auroral display began on the 22d on the Pacific coast, where it was seen by a large proportion of the observers in Washington, Oregon, and northern California, whereas it was seen on that evening by only a small portion of the observers in the Eastern States. On the 23d it was not seen on the Pacific coast, partly owing to cloudiness, and at only a small portion of the Rocky Mountain stations, whereas it was seen in a large portion of the Middle and Eastern States. On both nights the proportion of stations in the Dakotas, Minnesota, and adjacent States was about the same. The conclusion suggested by these facts, viz, that the conditions favorable to the aurora were moving eastward across the continent, is confirmed by the following paragraphs.

4. By charting the absolute times of beginning and by drawing lines showing the times of sunset over the country we obtain the interval between sunset and the first appearance of the aurora, and notwithstanding the irregularities in the records, it becomes apparent that on the 22d the aurora began to be visible 1 hr. and 40 min. after sunset in California, 1 hr. and 30 min. in Oregon, and 1 hr. and 20 min. in Washington. Over Idaho, Montana, North Dakota, northern Minnesota, Wisconsin, and Lake Superior the interval after sunset was, for the earliest reports, from one to two hours, averaging about the same as northern California. Further south and east of this belt there was a region about 500 miles broad in which the aurora, or rather individual local auroras, first began to appear between two and three hours after sunset. Finally, at most stations in Kentucky, Ohio, New York, and New England, if visible at all, auroras occurred from three to four hours after sunset; there is every appearance of a promulgation eastward of the conditions favorable to the aurora, the rate being most rapid on the Pacific coast and least rapid in the interior.

5. The movement is like that of the front of a school of fish where each fish is pushing ahead of his fellows and is well brought out if, instead of comparing stations that lie east and west of each other, we collate those that lie north and south, from which it appears that the aurora always began later after sunset at southern stations than at northern ones, and that, in fact, in the extreme north it was doubtless in progress at and before sunset; this points unmistakably to the conclusion that either the cooling by radiation, which we call nocturnal cooling, or the general south and east movement of masses of cold air, or both, brought the atmosphere into those conditions as to temperature and humidity that were necessary for the auroral display. On the 21st and 24th a few auroras were reported from both the central auroral area and the outlying States, showing that favorable conditions are always present here and there, and that the general aurora is due to a special combination of these.

6. The relative importance of the movement of cold air and of the nocturnal radiation is shown by comparing the chart of auroral display with the daily weather chart, from which it will be seen that for a week before the aurora the great area of high pressure, No. VII, with its attendant cold, dry air and clear sky, had been pressing southeastward from Alberta into the Missouri Valley and the Lake region. Auroras were reported on the 21st at a few stations in the Lake region and in North Dakota, Idaho, Nevada, and Oregon. This layer of cold air near the surface of the earth must, according to all experience, have been accompanied in its latter stages by comparatively warm air above it, and in the nearly horizontal plane between these two layers was one whose moisture and temperature required only a slight cooling, due to nocturnal radiation, in order to bring it into the condition in which the aurora was possible. As the isotherm of  $20^{\circ}$  on the p. m. map

includes nearly the whole area of visibility we note that the movement of the front of the area of high pressure from February 20, 8 p. m., to February 21, 8 p. m., had not carried the isotherm of  $20^{\circ}$  appreciably south or east or west; it had barely held its own for three days, but from the 21st to the 22d this isotherm had moved northward across the line from New Mexico to New England and slightly eastward across the line from New Mexico to British Columbia; therefore, a great layer of cold air was here hemmed in by the Rocky Mountains and the Appalachian range, filling the lowlands, moving southward, pushing some surface air northward but in other regions rising and flowing back overhead on itself, and steadily accumulating a layer of warmer, moister air above it.

The progress south and east of the high area had prepared the way at a comparative slow rate of advance, but the process of cooling by radiation is one that goes on simultaneously and attains the proper degree almost simultaneously, over large regions, and this, alone, explains the rapid spread of the aurora further south and east during the evenings of the 22d and 23d, when once the way had been prepared. The southward increase of the interval between sunset and visibility was, on the 22d and on the Pacific coast, at the rate of about one minute of time to each degree of latitude, but in the dry interior between the ninetieth and one hundredth meridians and the thirty-ninth and forty-ninth parallels it was at the rate of about fifteen minutes of time to the degree.

If the angular rate at which an observer perceives his own auroral light to advance southward be compared with the general linear rate of progress of the whole display from station to station there will result a determination of the altitude of the auroral stratum above the earth. Thus, fifteen minutes of time for  $1^{\circ}$  of latitude for the general advance, and fifteen minutes of time for an apparent advance at any station from  $45^{\circ}$  altitude in the north to the observer's zenith, would correspond to an altitude of 70 miles. If this calculation be applied to the "merry dancers" that move in a second, or less, from the horizon up to the zenith, it gives an altitude of 1 mile.

7. In so far as distinctly well-marked beams and arches were recorded on the 22d and 23d they show no such agreement as to time and location as to justify any effort to determine the exact distance of the aurora from the stations, but they confirm the conclusion long since announced that such parallax methods are impracticable and illusory.

Many observers describe waves or beams, streamers or clouds of light as moving from east to west or from west to east. If this motion were due to general causes, it would be an important item of knowledge. On collating the reports it would seem that none have recorded the phenomena with sufficient fullness and accuracy to warrant minute analysis. Six observers report that streamers moved at first from east to west and subsequently from west to east; two speak of them as moving east and west; seven speak of them as moving from east to west and say nothing about the contrary movement; three speak only of the motion from west to east.

8. On both the western and southern sides of the aurora of the 22d and 23d the temperature of the air at the surface became warmer on the following day, but on the eastern side the temperature fell with the advance of the region of high pressure. As this region of fall was limited by the absence of reports and not by a meteorological boundary it does not argue against the general principle that the most extreme limit east as well as west at which an aurora appears is one over which the temperature will probably rise the next day in proportion as the cold and dryness of the high area is being overcome by the warmth and moisture of the regions into which it is advancing.

9. The U. S. Naval Observatory at Washington reports

that a magnetic storm began on the 20th and continued for a week thereafter, the details of which will be published elsewhere. Apparently, therefore, the electric disturbance that caused the magnetic storm had accompanied this area of high pressure from its very beginning in Siberia or Alaska.

10. As a suggestion in future observations of the aurora and in order to save time it is recommended that when an aurora appears in the early evening each observer should first determine the exact error of his watch on standard seventy-fifth meridian time, and then, in addition to any general description of the aurora that he may choose to make, should make an exact description of the location of the beams.

streamers, and arches and the colored lights at the exact minute of the beginning of the whole hours 7, 8, 9, 10, or 11 p. m. of this standard time and should note whether at such moments the beams are moving eastward or westward.

#### EARTH CURRENTS AND MAGNETIC STORMS.

The U. S. Naval Observatory at Washington reported a remarkable magnetic storm from the 20th to the 26th.

Disturbances on the telegraph lines were reported on the following dates, viz, at Davenport, Iowa, February 22, for one hour on lines in all directions; Kansas City, Mo., on the 23d; Duluth, Minn., 22d, 23d, 24th, 28th.

### STATE WEATHER SERVICES.

[*Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.*]

The following extracts and summaries are republished from reports for February, 1894, of the directors of the various state weather services:

#### ALABAMA.

*Temperature.*—The mean was 1.4 below the normal; maximum, 80, at Brewton, 21st. and at Geneva, 9th and 18th; minimum, 12, at Opelika, 13th; greatest monthly range, 59, at Newburg and Opelika; least monthly range, 41, at Birmingham.

*Precipitation.*—The average was 2.42 above the normal; greatest monthly, 16.54, at Brewton; least monthly, 1.71, at Sturdevant.

*Wind.*—Prevailing direction, north.—*F. P. Chaffee, Local Forecast Official, Weather Bureau, Montgomery, director.*

#### ARIZONA.

*Temperature.*—The mean was 5.0 below the normal; maximum, 89, at Buckeye, 28th; minimum, —9, at Flagstaff, 14th; greatest monthly range, 71, at Whipple Barracks; least monthly range, 43, at Oracle and Red Rock.

*Precipitation.*—The average was 0.10 below the normal; greatest monthly, 3.43, at Fort Grant; least monthly, trace, at Parker and Yuma.—*W. Burrows, Observer, Weather Bureau, Tucson, director.*

#### ARKANSAS.

*Temperature.*—The mean was 6.3 below the normal; maximum, 75, at Blanchard Springs and Hamburg, 19th; minimum, zero, at Rogers, 15th; greatest monthly range, 64, at Rogers; least monthly range, 41, at Mount Ida.

*Precipitation.*—The average was 1.98 above the normal; greatest monthly, 11.46, at Searcy; least monthly, 2.15, at Gaines Landing.

*Wind.*—Prevailing direction, north.—*F. H. Clarke, Local Forecast Official, Weather Bureau, Little Rock, director; G. G. Harkness, Observer, Weather Bureau, assistant.*

#### CALIFORNIA.

*Temperature.*—The mean was 3.0 below the normal; maximum, 90, at Indio and Volcano Springs, 27th; minimum, —15, at Truckee, 11th; greatest monthly range, 72, at Weaverville; least monthly range, 24, at San Francisco and Point Reyes Light.

*Precipitation.*—The average was 0.09 below the normal; greatest monthly, 16.48, at Meadow Valley; least monthly, 0.12, at Needles.

*Wind.*—Prevailing direction, west.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

#### COLORADO.

*Temperature.*—The mean was 8.0 below the normal; maximum, 73, at Lamar, 23d; minimum, —34, at Steamboat Springs, 4th; greatest monthly range, 85, at Akron; least monthly range, 37, at Pikes Peak.

*Precipitation.*—The average was 0.10 above the normal; greatest monthly, 7.77, at Breckenridge; least monthly, trace, at Kirk.

*Wind.*—Prevailing direction, west.—*R. H. Sullivan, Observer, Weather Bureau, Denver, acting director.*

#### CONNECTICUT.

(See New England.)

#### DELAWARE.

(See Maryland.)

#### FLORIDA.

*Temperature.*—The mean was 2.1 below the normal; maximum, 86, at Orlando, 3d, at Orange City, 14th, and at Plant City, 10th and 19th; minimum, 28, at Mosely Hall, 6th, and at Tallahassee, 16th; greatest monthly range, 53, at Archer and Orange City; least monthly range, 27, at Key West.

*Precipitation.*—The average was 0.50 below the normal; greatest monthly, 11.19, at Tallahassee; least monthly, 0.02, at Key West.

*Wind.*—Prevailing direction, southwest.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

#### IDAHO.

*Temperature.*—Maximum, 58, at Lewiston, 28th; minimum, —31, at Paris, 23d; greatest monthly range, 85, at Paris; least monthly range, 28, at Atlanta.

*Precipitation.*—Greatest monthly, 5.78, at Boise Barracks; least monthly, 0.39, at Chesterfield.

*Wind.*—Prevailing direction, west.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

#### ILLINOIS.

*Temperature.*—The mean was 3.1 below the normal; maximum, 65, at Palestine, 9th; minimum, —14, at Oswego, 21st; greatest monthly range, 63, at Philo; least monthly range, 43, at Saint Johns.

*Precipitation.*—The average was 0.89 below the normal; greatest monthly, 5.01, at Palestine; least monthly, 0.30, at Effingham.

*Wind.*—Prevailing direction, northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

#### INDIANA.

*Temperature.*—The mean was 2.7 below the normal; maximum, 67, at Seymour, 9th; minimum, —10, at Valparaiso, 21st; greatest monthly range, 65, at Lafayette; least monthly range, 43, at Huntingburg.

*Precipitation.*—The average was 0.25 below the normal; greatest monthly, 6.50, at Marengo; least monthly, 1.46, at Logansport.

*Wind.*—Prevailing direction, northwest.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

#### IOWA WEATHER AND CROP SERVICE.

*Temperature.*—The mean was 3.0 below the normal; maximum, 60, at Glenwood, 7th; minimum, —19, at Atlantic, 21st; greatest monthly range, 72, at Atlantic; least monthly range, 44, at Mount Pleasant.

*Precipitation.*—The average was 0.50 below the normal; greatest monthly, 2.41, at Seymour; least monthly, trace, at Rock Rapids and Sibley.

*Wind.*—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

#### KANSAS.

*Temperature.*—The mean was 4.9 below the normal; maximum, 79, at Coldwater, 19th; minimum, —16, at Lakin, 12th; greatest monthly range, 78, at Manhattan; least monthly range, 57, at Rome.

*Precipitation.*—The average was 0.29 above the normal; greatest monthly, 2.82, at Lebo; least monthly, 0.10, at Eldorado.

*Wind.*—Prevailing direction, south.—*T. B. Jennings, Observer, Weather Bureau, Topeka, director.*

#### KENTUCKY.

*Temperature.*—The mean was 2.2 below the normal; maximum, 74, at Bowling Green, 9th; minimum, 2, at Elizabethtown, 5th; greatest monthly range, 64, at Eubanks and Harrodsburg; least monthly range, 46 at Catlettsburg.

*Precipitation.*—The average was 0.12 above the normal; greatest monthly, 7.99, at Russellville; least monthly, 2.98, at Pellville.

*Wind.*—Prevailing direction, northwest.—*Frank Burke, Local Forecast Official, Weather Bureau, Louisville, director.*

#### LOUISIANA.

*Temperature.*—The mean was 5.1 below the normal; maximum, 87, at Opelousas, 20th; minimum, 17, at Sugartown, 16th and 26th; greatest monthly range, 66, at Lake Charles; least monthly range, 40, at Port Eads.

*Precipitation.*—The average was 2.75 below the normal; greatest monthly, 13.83, at West End (New Orleans); least monthly, 2.92, at Minden and Delhi.

*Wind.*—Prevailing direction, north.—*R. E. Kerkam, Local Forecast Official, Weather Bureau, New Orleans, director.*